

THE STUTTERING GAME: APPLYING SPORTS PSYCHOLOGY
INTERVENTIONS TO STUTTERING MANAGEMENT

by

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ABSTRACT

Sports performance training in athletes and stuttering management for people who stutter (PWS) have striking parallels. Emotions, especially anxiety and stress, are a prominent threat that can negatively impact movements, especially during high stakes performances for athletes and everyday speaking scenarios for those who stutter. Specifically, the dynamic relationship between physical motor and psychological components are key contributors to successful sports performance and stuttering management. Due to these similarities, the purpose of this paper is to create a theoretical framework on how sports psychology interventions that address anxiety can be applied to stuttering management to help PWS speak with minimal interference from unhelpful thoughts and emotions. Different evidence-based practices in sports psychology that helps athletes combat stress and anxiety during performance include pre-performance routines, visualization, cognitive restructuring interventions, daily goal setting, and competition simulations and plans. These sports psychology interventions can be applied to stuttering management to help PWS effectively manage their anxiety during stressful communication situations. Ultimately, these may decrease unhelpful physical reactions (e.g. tension) to the stuttering moment, which has positive correlations with reducing the impact of stuttering. A major limitation/caveat to applying sports psychology to stuttering is the fact that sports movements are learned, whereas stuttering is *not* a learned behavior. Thus, one needs to be cognizant that the purpose of these interventions is not to reduce/eliminate stuttering, rather to change the persons reactions to stuttering.

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Chapter 1: Introduction: What is Stuttering?

Imagine being stuck in quicksand, the more effort one exerts, the deeper they will sink. As this cycle continues, the more out of control one feels. This quicksand analogy is one way to capture the experience of living with a stutter. According to the American Speech-Language-Hearing Association (ASHA, 2019), stuttering is defined as a neurodevelopmental disorder that involves the interruption of the flow of speech characterized by different types of disfluencies such as repetitions, prolongations, and blocks. These three types of disfluencies are rarely heard in the speech of those who do not stutter, and are referred to as “stuttering-like disfluencies” (Ambrose & Yairi, 1999). Repetitions consist of repeated sounds, syllables, and words. These repetitions can either be part-word or one-syllable word repetitions. The W sound in the sentence “I w-w-w-went to school” is an example of a part-word repetition. The word “can” in the sentence “can-can-can I see?” is an example of a one-syllable word repetition. Prolongations are a disfluency characterized by stretching out/prolonging sounds or syllables within a word, typically the first sound in a word. An example of a prolongation is when the “l” in like is stretched out “lllllllike”. Blocks are the third type of stuttering-like disfluency characterized by an obstruction to the flow of air or voice and movement of the articulators. The pause in the word “hungry” in “I am h-----ungry” is an example of a block. These stuttering-like disfluencies are also referred to in the literature as the “core” behaviors of stuttering and should be distinguished from other “typical disfluencies” that are experienced by all speakers.

The overt disfluencies are the primary aspect of stuttering noticed and heard by listeners; however, for those who stutter, a larger part of the stuttering are negative

reactions to speaking, avoidance behaviors (sounds, words, people, and speaking situations), and secondary behaviors (eye blinking, head nodding, tension, etc.) that accompanies the moment of stuttering. Children and adults who stutter experience psychological, emotional, social, and functional consequences from their stuttering. For most people who stutter, the adverse impact a person who stutters (PWS) experiences contributes to the growth of these negative emotions. One example is when a PWS is teased when they stutter. Another example is when a PWS cannot get a job due to their stutter (Gerlach et al., 2018). Every time negative consequences like this occur for a PWS, it reinforces and amplifies the feelings of shame, fear, and depression which can result in the development of social anxiety, loss of control, and negative feelings regarding their self-perception and communication.

The onset of stuttering typically occurs in between 30 to 48 months of age (Bloodstein & Ratner, 2008); (Yairi & Ambrose 2005, 2013). Bloodstein and Ratner (2008) found that based on various studies of school-aged children in the United States, Europe, Africa, Australia, and the West Indies, the prevalence of stuttering in school-age and older is approximately 1%. The incidence of stuttering is defined as the amount of people who have ever stuttered in their life. Andrews and Harris (1964) reviewed studies on the incidence of stuttering and found that the incidence of stuttering is approximately 5% for individuals who have stuttered for at least 6 months. More recent studies of incidence Dworzynski et al., (2007); Reilly et al, (2009) report a higher incidence of 8%. There is notable difference in incidence (5%) and prevalence (1%) in stuttering. This disparity is due to the high spontaneous recovery rate for children who stutter (especially females) within the first 18 months from onset. At least 3 studies have shown that

approximately 65 % (Ryan, 1990), 79% (Andrews and Harris, 1964), and 80% (Panelli et al., 1978) of children will recover spontaneously with or without intervention.

Epidemiologic factors such as age and gender heavily influence the persistence or recovery of stuttering.

A growing number of research studies indicate a genetic basis of stuttering due to its extremely high heritability and the identification of new genes associated with stuttering (Frigerio-Domingues & Drayna, 2017). The genetic factors play a role in the development of the brain's structure and function, which have been found to be a critical factor contributing to stuttering onset and persistence. Stuttering occurs due to delays and disruptions occurring in the brain simultaneously during the process of speech which leads to mistiming and discoordinated movements in the speech structures (Guitar, 2019). For most, the left hemisphere is the dominant hemisphere for language and recent neuroimaging studies are reporting both anatomical and functional differences in the language and speech regions of the left hemisphere of children and adults who stutter. Specifically, disruptions in the neural communicative network caused by the reorganization of new neural networks or insufficient myelination underlying regions involved with sensorimotor processing of speech are contributing factors. The vulnerability of these insufficient neural networks in the speech and language areas of the brain is one of the many factors that causes stuttering (Guitar, 2019). While at its core stuttering is tied to a disruption in the forward flow of speech, the feeling of being stuck creates discomfort for the speaker and adds a psychosocial dimension to the experience of stuttering from a very young age.

Psychological Impact of Stuttering

While the mechanical aspects of stuttering that result in the disfluencies perceived by the listener are important, the psychological impact stuttering has on the person who stutters is arguably even more important. As alluded to earlier, stuttering can have a significant negative impact on one's quality of life. In the literature, the overt disfluencies are referred to as "core" behaviors and include the part-word repetitions, prolongations, and blocks. However, as children and adults continue to stutter and feel a loss of control while speaking, they often begin to develop a host of unhelpful feelings and thoughts that are associated with the disfluencies (Tichenor & Yaruss, 2020). Research has shown us that several negative emotions such as anxiety, shame, fear, doubt, and depression usually accompany stuttering (Corcoran & Stewart, 1998). These negative emotions are influenced by associated behaviors that are identified as secondary behaviors.

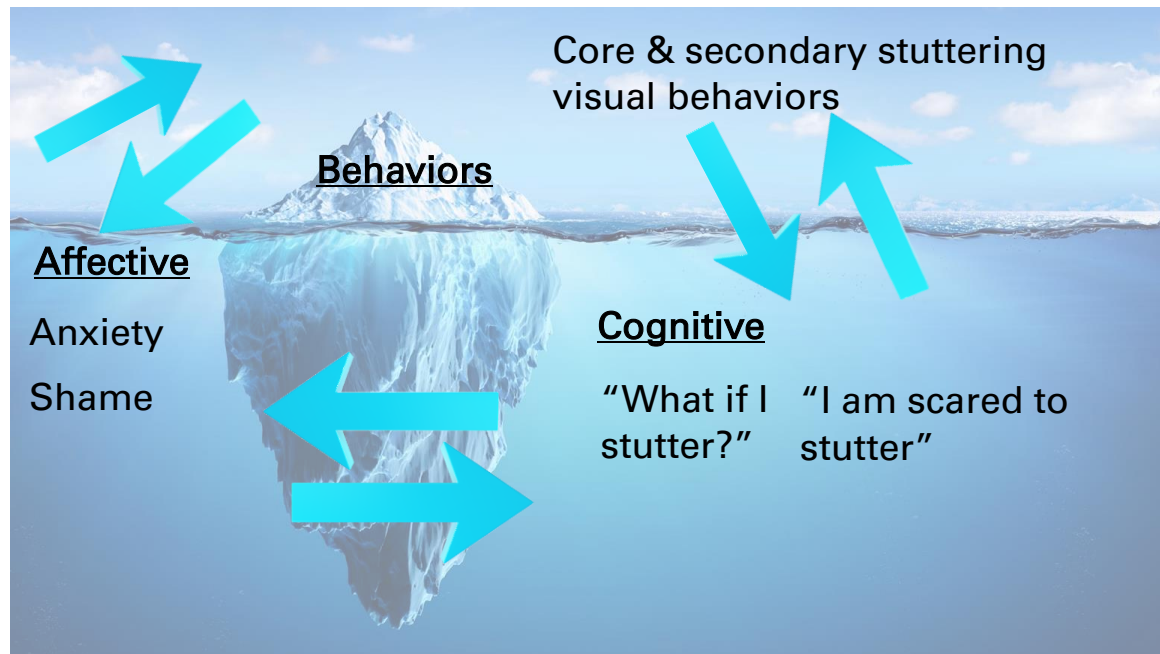
Secondary stuttering behaviors are involuntary learned behaviors that are developed over time to either postpone or escape the moment of stuttering. These secondary behaviors include but are not limited to physical concomitants such as facial and neck tension, eye blinks, head nodding, head turns, and feet/hand tapping. These associative symptoms can be painful which is a contributing factor that leads to a negative quality of life for a PWS. Classical and operant conditioning play a role in the development of secondary behaviors. Secondary behaviors that include eye blinks, physical tension, head nods, etc. are considered learned behaviors in response to stuttering-like disfluencies. A young child who begins to stutter usually develops these learned conditions as a result of being exposed to negative listener reactions. Examples of negative listener reactions include the listener laughing or showing impatience. The perceived threat that arises when they stutter causes them to develop a response that will

help them stop or decrease their instances of stuttering. In the scenario where this tension response occurs repeatedly after each stutter, over time, the child develops a conditioned response. The conditioned muscular response that arises when a stutter occurs, in turn, triggers an increase of the duration of the stuttering moment. In this instance, secondary behaviors can cause physical pain, thus amplifying the negative emotions that coincide with stuttering (Guitar, 2019). Operant conditioning contributes to the development of secondary behaviors by developing a protective response to escape the moment of being stuck during a stutter. These unconscious behaviors include using eye blinks, head nods, or hand/foot tapping to get out of the moment of an intense block, thus relieving the emotional and physical pain that accompanied the stutter. Over time, the association of using these escape behaviors to relieve the intense moment of stuttering instills a habitual patterned response each time the individual stutters.

As discussed, the physical elements (core and secondary behaviors) and the cognitive/affective elements (thoughts and emotions) of stuttering dynamically influence each other. Dr. Joseph Sheehan accurately captures all aspects of the stuttering experience through his stuttering iceberg analogy (Figure 2). The top of the iceberg demonstrates the physical core and secondary behaviors that are perceived by the listener during a moment of stuttering. Although listeners can only see and hear the physical characteristics of stuttering-like disfluencies and associative physical concomitants, it is critical to understand that the cognitive, behavioral, and affective components heavily influence stuttering. The iceberg analogy for stuttering accurately demonstrates this notion because the area below the iceberg takes up more space compared to the top portion that is visual to the listener. The higher and lower surfaces of the iceberg

constantly evolve and influence each other which causes stuttering to fluctuate overtime.

(Figure 1: The Stuttering Iceberg Analogy)



One of the common emotions that people who stutter experience is social anxiety. Research has found that approximately 22% to 60% of adults who stutter are also diagnosed with social anxiety disorder (Iverach et al., 2017). The development of social anxiety in stuttering can be attributed to negative listener reactions or communication situations. Negative reactions can cause a PWS to doubt their communicative abilities, often fearing future speaking situations. This is because the PWS associates this negative interaction of the moment of stuttering and the memory is stored long-term in our “emotional brain”, a region known as the amygdala that is part of the limbic system (Guitar, 2019). As a child who stutters continues to experience negative listener reactions, they continue to feel more embarrassment, shame, fear, and depression. An increase of negative labeled memories is encoded in the amygdala which further amplifies the negative emotions towards their stutter. Thus, even in the absence of

negative listener reactions in the future, the stuttering itself will elicit the negative memory and perpetuate this cycle.

The physical concomitants or secondary stuttering behaviors such as eye blinks, tension, foot tapping, and head turning are all considered learned autonomic behaviors that are designed to either postpone or escape a moment of stuttering quickly. Interestingly, the intended function of these secondary behaviors is contradicting their objective of decreasing stuttering-like disfluencies because these behaviors increase the severity of stuttering, thus contributing to the increased encoding of negative memories associated with stuttering. It is not surprising that a child who stutters often develops negative attitudes toward stuttering and speaking, to the point of avoiding speaking when feasible. This response pattern can drastically impact their participation in various social activities and communication situations. Furthermore, the presence of social anxiety with relation to speaking can actually increase speech motor instability, causing more stuttering and has been reported to negatively impact stuttering treatment outcomes (Iverach et al., 2011). Speech is a motor act, and for a person who stutters, added layers of fear and anxiety often result in an increase breakdown of speech, easily observed by a listener as more severe stuttering. It is not surprising then that most PWS are fluent when alone or speaking to a pet (Bloodstein & Ratner, 2008, Jackson et al., 2021) and experience more stuttering in social speaking contexts. We can view the act of social speech for a PWS from the lens of performance in competitive sports, or “sports performance”. In the next two chapters we will explore how the motor/physical aspects of speech (stuttered or fluent) are correlated with sports performance (Chapter 2). In chapter

3, we will explore how the cognitive and affective (mental) aspects of stuttering are correlated with sports performance.

Chapter 2: Physical/Motor Correlations Between Stuttering/Fluency and Sports Performance:

Performance is defined as the action or process of carrying out or accomplishing a task or function. When the term performance comes to mind, one may correlate the term with sports. Sport performance heavily influences the result of a game, thus signifying its importance. Athletes perform at varying capabilities, but there are a select few elite athletes that distinguish themselves from the rest. How do these “elite” athletes consistently perform at a high level? Natural physical characteristics such as fitness, balance, strength, agility, speed, weight, height, etc. influence an athlete’s performance level. Athletes who are fast, strong, and physically fit are at an advantage to perform well based on their physical capabilities. Although this is true, that does not mean the more physically fit athlete will perform well each time. The psychological characteristics of an athlete can make or break their performance. So, athletes who are not as physically fit still have the capabilities to perform well through self-confidence, laser focus, and motivation. Similar to sports performance, speech mechanics relies on physical components to perform at a high level. This chapter will discuss the physical mechanisms that contribute to athletic performance and how that can be applied to stuttering management.

Physical/Motor Influence on Athletic Performance

What comes to mind when watching a sporting event? The physical characteristics of an athlete is a common observation most people will notice and link with high performance. To the visual eye, it is not hard to understand why some athletes perform at a high level. A spectator may first notice the weight, speed, agility, balance,

strength, and height of an athlete. Consider the sport of football for example. The physical abilities of a football player are one aspect that helps them gain a competitive edge. Depending on the position, different physical characteristics contribute heavily to performance level. An offensive/defensive lineman that is big, tall, and strong will heavily influence their success at blocking or tackling. Running backs and wide receivers that are fast usually outrun their opponents to score touchdowns. The quarterback that has enough arm strength to throw the ball with sufficient velocity to his wide receivers will heavily influence his success at the position. Physical characteristics such as weight, height, speed, strength, agility, balance, and stamina to name a few, are genetically predisposed to an individual. There are some athletes who are at an inherent genetic disadvantage which prevents them from performing at a high level. So, how do athletes who are not genetically gifted find a way to perform despite their lack of physical abilities? As alluded to earlier, an athlete does not need to be physically gifted to perform well. For example, a wide receiver does not have to be the fastest, tallest, or strongest to catch the football and score touchdowns. Ultimately, exhibiting toughness, focus, resiliency, and confidence can help an athlete compensate for their lack of physical gifts and perform well. The variability of brain structure and function within and across individuals helps explain the difference in physical abilities across individuals in sports.

A highly gifted physical athlete is neurologically wired differently compared to a less-gifted athlete. Understanding the anatomical and physiological mechanisms of motor function is necessary to comprehend how athletes use their physical capabilities to execute intricate movements. A wiring connection from the motor strip in the frontal lobe of the cerebral cortex to the spinal cord is what innervates movement of the trunk and

limbs. This intricate process is critical because if these neural connections are weak, then the intended muscle movement will become weak as well (Mueller et al., 2022). The implications of this regarding sports is athletes need to have sufficient neural firings and connections in their central nervous system (CNS) in order to execute a sophisticated muscular movement. Next, let's explore how anatomical and physiological motor functions influence performance in communication/speech for a PWS.

Physical/Motor Influence on Speech/Communication Performance

Much like executing a desired movement in sports, anatomical and biological factors contribute to executing the correct sequence of movements for desired speech production. A PWS is neurologically wired differently compared to an individual who does not stutter. As mentioned earlier, stuttering occurs due to delays and disruptions occurring in the brain simultaneously during the process of speech which leads to mistiming and discoordinated movements in the speech structures (Guitar, 2019). The vulnerability of these insufficient neural networks in the speech and language areas of the brain is one of the many factors that causes stuttering (Guitar, 2019). In the context of speech performance, this significantly puts individuals who stutter at a disadvantage from an anatomical and physiological perspective, much like athletes who are at an inherent genetic disadvantage presenting barriers for them to perform at a high level. For example, a PWS may be at a disadvantage from achieving their communication needs if they stutter during an important interview, on the phone, asking someone out on a date, or during a presentation. Although anatomical and biological disadvantages can create barriers for performance, it is still possible for a PWS to achieve their communication needs. Like in sports, physical breakdown inevitably occurs for a PWS and they are

increased in frequency and severity under stress (e.g., speaking to a group for a PWS, playing for the gold medal at the Olympics for an athlete). To rise above these physical breakdowns, elite athletes possess a strong mindset by exhibiting confidence, ease, and determination. To compensate for speech breakdowns/stuttering moments, it is imperative that PWS are equipped with the same psychological characteristics as elite athletes to help them perform their communication needs. Being equipped with mental strength, resiliency, and self-confidence can propel a PWS to achieve their desired communication needs. Possessing these psychological characteristics will not eliminate the stuttering moment, but it can reduce the physical and emotional reactions (i.e., secondary behaviors) that contribute to the severity of the core stuttering behaviors. For example, a confident approach to speaking where the PWS uses good eye contact may help reduce secondary behaviors (i.e., eye blinks and head turns) to engage their listener and reducing communication breakdowns. In chapter 3, we will explore the psychological correlations between stuttering and sports performance.

Chapter 3:

Psychological Correlations Between Stuttering and Sports Performance:

The psychological makeup of an athlete can either make or break their performance. In many instances, it is the psychological component that distinguishes the good from the elite. Although the physical characteristics of an athlete play an important role in performance, an athlete cannot solely rely on their physical characteristics. Consider a few quotes by famous athletes who suggest that the psychological aspect of performance is critical. Yogi Berra, a Major League Baseball (MLB) Hall of Famer, said “Baseball is 90% mental. The other half is physical (Chen, 2015).” Arnold Palmer, a legendary professional golfer, said “The total time spent by the golfer actually swinging and striking the ball during those 72 holes is approximately seven minutes and 30 seconds, leaving 15 hours, 52 minutes and 30 seconds of thinking time (Bali et al, 2015).” Similar to sports performance, speech is heavily influenced by psychological components. So much so, that many theories on the causation of stuttering during the early 1900’s described it as a psychological disorder (Bloodstein & Ratner, 2008), possibly based in fluent speakers’ experiences of disfluency while speaking under stress/duress (MacKinnon, Hall & MacIntyre, 2007). This chapter will discuss how psychological mechanisms influence athletic motor performance and how that is applied to a PWS performing their communication/speech needs and managing their stutter.

Influence of Anxiety on Motor Performance in Sports

The psyche of an athlete has an immense amount of influence on motor performance for athletes. There is a dynamic relationship between the psychological and

motor components of an athlete. Specifically, this dynamic relationship is a consistent cycle where thoughts, emotions, and feelings influence motor performance in an athlete and vice versa. If an athlete's psyche is filled with negative thoughts such as doubt and fear during a game, then that will most likely cause physical breakdowns to occur.

Anxiety is a prominent emotion athletes may experience during a game. Several factors such as expectations, pressure, fear of failure etc. elicit and amplify the anxiety an athlete experiences during a game which is noteworthy because anxiety is known to negatively impact performance. Anxiety contributes to the activation of the autonomic nervous system which has implications for performance. Anxiety affects the autonomic nervous system by increasing heart rate, blood pressure, breath frequency, muscle activity, and energy expenditure which all contribute to less efficient motor movements (Nieuwenhuys & Oudejans, 2012). Anxiety's effect on attention also has implications for motor performance in athletes.

Anxiety can negatively impact an athlete's attentional control which is critical for motor performance. This occurs because anxiety increases the activation of the amygdala, which in turn, decreases pre-frontal lobe control mechanisms responsible for attention (Bishop et al., 2004). Anxiety causes an athlete's attention to shift focus away from the movement and to a perceived "threat" (opponent, failure, etc.). This attentional shift prevents the athlete from focusing on calibrating and adjusting their movements to achieve a desired motor outcome (Nieuwenhuys & Oudejans, 2012). Also, anxiety may lead to a breakdown in automatic control processes for movement, which makes athletes susceptible to decreased performance (Nieuwenhuys & Oudejans, 2012). For example, external pressures (e.g., fan expectations) may elicit anxiety in a baseball player during

an at-bat. This has negative implications on the batter's swing because anxiety can cause an athlete to pay too much attention to controlling otherwise natural movements such as a swing can introduce rigidity causing a breakdown of movement. Next, we will explore how psychological components that influence motor performance in sports might influence performance in speech for a PWS.

Anxieties Influence on Communication/Speech Performance for PWS

Similar to athletes in a sports tournament, the act of social speech (i.e., speaking to one or more listeners) serves as a "tournament" for PWS who feel pressure to speak fluently and conform to societal norms. Thus, the psyche of a PWS can heavily influence their "performance" in motor speech production and communication. Anxiety is a common symptom most PWS experience prior to and during the act of speaking (Craig, 1990). Past negative experiences and perceived threats by a PWS contribute to the elicitation and amplification of their anxiety during communication situations. These threats may include negative listener reactions, loss of control, stressful speaking situations, etc. Anxiety has negative implications for motor speech performance for a PWS. For instance, emotional distress causes activity in the right hemisphere to interfere with the sequential speech motor control in the left hemisphere, thus causing abnormal sequencing of articulation movement and control which results in stuttering (Guitar, 2019). Also, the complex relationship between anxiety and secondary behaviors has implications in motor speech performance for a PWS.

As discussed earlier in chapter 1, secondary behaviors are a classical and operant conditioned protective mechanism developed to combat perceived threats. A prominent secondary behavior most PWS experience is muscular tension. Like in athletes, anxiety

can cause excessive muscular tension for PWS. This has relevance in motor speech performance for PWS because increased muscular tension characterized by antagonist functions results in slower processing and discoordination of articulatory movements which contribute to stuttering (Guitar, 2019). Next, we will explore how stuttering can negatively impact communication performance and speech motor control for PWS.

When stuttering occurs, many PWS may not be able to meet their communication needs due to the relationship between anxiety and motor performance. While anxiety does not cause stuttering, anxiety often results from the experience of stuttering (Guitar, 2019). Like in athletes, anxiety can impact attentional control for a PWS causing too much attention to be diverted to another automatic/natural process of speaking causing rigidity and increased chance of breakdowns. Further, anxiety impacts the speech performance for a PWS because their focus shifts from executing speech motor movements to perceived threats (i.e., listener reactions & time pressures) which can cause a breakdown in speech motor production, thus stuttering. Also like in athletes, a PWS who excessively focuses on the intended motor movement can cause them to be more susceptible to motor breakdown. For a PWS, excessively focusing on the required motor movements to maintain fluency can cause them to be more susceptible to core stuttering behaviors *and* associated physical concomitants resulting from the increase muscle rigidity. Now that we have established how the physical and mental aspects of stuttering are correlated to sports performance, in the next chapter we will explore the application of sports psychology to stuttering management.

Chapter 4: Sports Psychology and Stuttering Management

Psychological components directly influence motor control. As discussed earlier in chapters 2 and 3, this has major implications on performance levels both for athletes and PWS. High performing athletes are driven by high levels of self-confidence, determination, and resiliency. The field of sports psychology has been critical for strengthening mindsets and enhancing performance in athletes. Specifically, sports psychology involves extending theory and research into the field to educate athletes about the psychological aspects of their sport and activity. The primary goal for sports psychologists is to facilitate optimal involvement, performance, and enjoyment in sport and exercise (Portenga et al., 2017). It has been found that the proper use of sports psychology training and strategies in athletes can help boost performance. Thus, applying the foundations of sports psychology to stuttering management can potentially be an effective tool for an SLP to implement in their practice with adolescents and adults who stutter.

Evidence-Based Sports Psychology Practices

Anxiety has been known to negatively impact physical performance for athletes. One factor that distinguishes high performing athletes from others is their ability to maintain focus on the task at hand despite excess anxiety brought on by pressure, expectations, etc. How does an athlete achieve this strong, goal-oriented mindset that revolves around focus, self-confidence, and determination? The use of different sports psychology practices helps athletes achieve these mental characteristics that will help them perform by combating stress and anxiety during performance. These evidence-based sports psychology practices can be applied to stuttering therapy to help a PWS

combat anxiety and help build self-confidence, resilience, and focus which will reduce the interference of emotions (especially anxiety) during speech.

Many sports psychology practices target anxiety management for athletes. This is imperative for an athlete's success because their body will be more susceptible to motor breakdowns when anxiety is present. External pressure is one of the main factors that contributes to anxiety in athletes. It has been found that pre-performance routines decrease the likelihood of choking in sports when pressure is present (Mesagno & Mullane-Grant, 2010). A pre-performance routine is a sequence of task-relevant thoughts and actions an athlete systematically engages in prior to performance (Mesagno & Mullane-Grant, 2010). So, an athlete only focuses on the task at hand (i.e., the goal/objective) instead of focusing on different threats. This helps maintain attentional control when pressure rises during a sporting event which is why a pre-performance routine is an effective intervention approach for athletes to combat anxiety during performance.

Other sports psychology interventions that have been found helpful in ensuring an athlete's performance is not plagued by anxiety include visualization and focusing on what can be controlled (Bali, 2015). Visualization is a technique used to combat anxiety. Visualization is a powerful technique for athletes because imagining victory sharpens their focus, eliminates irrelevant thoughts, and will give them more self-confidence to perform. Lastly, exclusively focusing on what can be controlled during a game is critical to an athlete's success. An athlete can risk their performance levels if they put too much emphasis focusing on factors out of their control such as the audience, opponents, and the result of the game. Only focusing on factors that can be controlled such as giving

maximum effort will decrease an athlete's anxiety level and keep them confident and in control, which has positive implications for performance.

Research has also found that cognitive restructuring interventions are effective in improving an athlete's performance in competitive situations (Weinberg & Comar, 1994). Specifically, restructuring negative thoughts to positive thoughts is essential for an athlete's success. Negative thoughts such as doubt and fear of failure can cause excess anxiety which leads to rigid muscle coordination during motor movements, thus impacting performance. On the other hand, restructuring their cognition to positive thoughts has positive implications regarding performance. If an athlete is filled with self-confidence, motivation, and positive self-talk, this frees the muscles to execute their natural motor movements. An athlete's ability to execute natural motor movements in harmony with their mindset is a recipe for success.

Sports psychology interventions such as daily goal setting, competition simulations, and competition plans (plans dealing with distractions during competition) have also been found to positively impact an athlete's performance during sport (Weinberg and Comar, 1994). Setting daily goals is essential to an athlete's success because it enhances motivation and focus on competition. Competition simulations help increase performance because consistent repetition ensures an athlete will be mentally prepared and confident for competition. Also, sufficient repetition of the target motor movement necessary for success will lead to natural and fluid execution of that movement during competition. Lastly, competition plans that adjust to distractions are important for athletes to engage in to ensure high performance. Failure is inevitable in sports, so it is important that athletes are wired to adapt and quickly bounce back from

such circumstances. An athlete who possesses resiliency will be better equipped to persevere through anxiety, pressure, self-doubt, physical pain, and other distractions. Entering with a game plan also elicits high confidence in athletes which is known to boost performance.

Athletes who are not as physically gifted can still have the competitive advantage over their opponent by engaging in these evidence-based sports psychology interventions mentioned (Weinberg and Comar, 1994). Consider this quote by Superbowl winning National Football League (NFL) coach, Vince Lombardi, “Life’s battles do not always go to the stronger or faster man. Sooner or later the man who wins is the man who thinks he can” (Goodreads, n.d). Next, let us explore how these evidence-based sports psychology interventions can be applied to stuttering management.

Sports Psychology Practices Applied to Stuttering Management

Implementing evidence-based sports psychology interventions can be beneficial tools for an SLP to use in stuttering therapy to help PWS effectively manage their stutter. These interventions can give PWS tools to overcome anxiety and engage in many speaking situations with confidence. Specifically, these tools can prevent anxiety from eliciting speech motor breakdowns that can lead to more frequent stuttering moments with severe physical concomitants. This is critical because PWS are less likely to perform to the level of the communication needs when these physical breakdowns occur, resulting in a temptation to avoid speaking, which further perpetuates this unhelpful cycle of stuttering.

Pre-performance routines used in sports can be an effective tool in helping a PWS prepare for different communication situations. The ability to focus on task-relevant thoughts for a PWS is crucial aspect in deciding the outcome of the communication situation. Focusing on thoughts such as “I am a confident and engaging communicator regardless if I stutter” and “I will not let a potential stuttering instance prevent me from saying everything that I have to say” can positively influence stuttering management for a PWS. Even if stuttering instances occur, this mindset instills the PWS with resiliency to continue to communicate what they want to say. Negative thoughts such as “I hope I do not stutter during this interaction” and “I am so scared of what the listener will think of me if I stutter” can elicit intense anxiety during the interaction which will cause the PWS to tense up. Menzies et al., (2008) have found success in applying these strategies within a larger Cognitive Behavior Therapy (CBT) program for adults who stutter. Anxiety does not cause stuttering, but it can aggravate the severity of the physical concomitants that accompany stuttering. That is why negative thoughts can negatively impact speech motor performance because the tension that arises during anxiety can increase the instances of speech motor breakdowns that can cause more severe stuttering.

Cognitive restructuring tools used in sports psychology can be helpful for stuttering management. This can be beneficial for PWS to effectively manage their stutter because shifting their negative thoughts to positive thoughts will help them have more confidence in their communication abilities regardless if they stutter or not. This will cause them to pursue more speaking situations they desire. Specifically, this tool can be effective for a PWS who is afraid to stutter and avoids communication situations to prevent showing their stutter to others. Unhelpful thoughts such as “I am afraid to show

the listener I stutter”, “What if the listener laughs at me?”, and “I won’t be able to communicate everything I want to say because I stutter” can further influence their negative perception about their stutter and themselves, thus increasing their avoidance behaviors. Restructuring these unhelpful thoughts to helpful thoughts such as “I will not let stuttering hold me back from talking to people”, “The way I speak is not as important as the message I have to share”, and “I will share everything I need to say regardless of if I stutter or not” can be empowering and very beneficial in helping PWS achieve their communication needs and effectively manage their stutter.

Visualization is another important sports psychology technique that can be applied to stuttering therapy. Like in sports, visualization for a PWS can potentially make or break them. A PWS who can visualize positive communication interactions before they occur will sharpen their focus by eliminating irrelevant thoughts. This will make PWS more prone to engage in more speaking situations and say everything they want to say. On the other hand, if a PWS visualizes a communication situation going horribly wrong, that will elicit anxiety and will make them more prone to not engage in speaking situations and say everything they want to say.

Other sports psychology interventions such as daily goal setting and competition simulations and plans can be very helpful tools for PWS to effectively manage stuttering. Like it does in sports, setting goals can motivate PWS to get out of their comfort zones and work towards meaningful change: improved stuttering management. A potential goal a PWS may have is to approach and talk to many people in public to help desensitize their stuttering so their anxiety towards speaking decreases. Achieving this stuttering desensitization has positive implications in improving stuttering management. Engaging

in competition simulations and developing plans for when communication breakdowns occur helps PWS feel more confident during speaking situations. Like in sports, practicing before an event (speaking situation) can eliminate the anxiety a PWS feels during speaking situations and make them feel more comfortable during these interactions. This desensitization tactic causing a calm mindset has positive implications in speech motor control during these interactions which can boost communication performance for PWS. Competition plans used in sports psychology serves as a tactic to help athletes be resilient and maintain focus when obstacles occur. This could potentially be a beneficial tactic for stuttering management. A PWS who has a plan to compensate and rebound from the inevitable speech “breakdowns” are less afraid to stutter during speaking situations. An example includes a PWS equipped to handle a situation where a listener negatively reacts to their stutter. Instead of responding with anger or avoidance, a PWS who has a plan may share their personal self-disclosure statement such as “I am person who stutters so it may take me longer to say what I want to say” or educate the listener about stuttering. One might argue that this is the most important strategy that can help with stuttering management since it requires regular practice of not only speaking but stuttering in front of new audiences. Desensitization to stuttering can help the PWS learn to shift their focus away from stuttering and apply their attentional resources to the “goal” which is communicating and connecting with others. Specifically, the PWS will be able to exclusively focus on being an effective and engaging communicator regardless if stuttering occurs rather than placing their attention solely on not stuttering.

Limitations

Although applying sports psychology interventions can be useful in improving stuttering management, it is imperative to understand that limitations exist in this theoretical framework. Specifically, sports movement are learned, and stuttering is not a learned behavior. As discussed in chapter 1, stuttering is a neurodevelopmental disorder that can persist into adulthood with no known cure. For this reason, it is important to be cognizant that the purpose of these sports psychology interventions is not to reduce or eliminate stuttering, but rather to change the persons reaction to stuttering.

Chapter 5: Conclusion

Achieving successful performance is a critical component that athletes strive for. It is important to note that physically gifted athletes who are bigger, stronger, and faster compared to less physically gifted athletes do not always win. Athletes who are less physically gifted can compensate by possessing a strong mindset that consists of confidence, resiliency, motivation, and sharp focus. Emotions such as anxiety and stress have a significant impact on performance. That is why physically gifted athletes who are not psychologically wired to combat anxiety and stress tend to have motor breakdowns during performance and fold under pressure or “choke.” Since those psychological components have a direct influence on movement, less physically gifted athletes who possess a strong mindset experience increased performance. This scenario is similar for PWS.

Like athletes before a game, a PWS may experience intense anxiety before a speaking situation. Letting anxiety take over the situation can have negative implications for speech motor control. This may not directly influence the frequency of stuttering moments, but it can influence the severity of the physical concomitants which can lead to a lack of self-control. Similar to a high performing athlete, a PWS can be effective communicators and manage their stuttering effectively by possessing a strong mindset that consists of confidence, resilience, motivation, and focus. Due to these striking similarities, evidence-based sports psychology interventions that help athletes combat anxiety during performance can be applicable to successful stuttering management and increasing communication performance for PWS.

Evidence-based sports psychology interventions such as pre-performance routines, visualization, cognitive restructuring, daily goal setting, and competition simulations and plans can, and in many instances have already, been applied to help PWS effectively manage anxiety in speaking situations and meet their communication needs. Pre-performance routines such as positive self-talk can help PWS prepare for various communication situations which can improve their confidence effectively communicating regardless if they stutter or not. Addressing the physical tension will have positive implications in helping a PWS feel more in control in the speaking situation. Positive visualization of a future speaking situation such as visualizing a scenario where the person stutters on every word and still was able to communicate everything they wanted to share is a technique that can help increase confidence and ease for PWS which will influence them to seek out speaking situations.

Cognitive restructuring techniques such as shifting from negative to positive thoughts can be an effective tool for PWS because it will cause them to perceive their stutter, communication abilities, and themselves in a more positive light which will give them confidence to pursue more speaking situations. Daily goal setting can be another effective sports psychology intervention tool for PWS because this will motivate them to constantly take steps towards achieving their communication needs. Finally, competition simulations and plans are another sports psychology tool that can help PWS effectively manage their stutter. Competition simulations used in sports psychology can be applied to stuttering management by simulating and practicing various communication situations before the actual situation. This can help a PWS alleviate their anxiety and boost their confidence during these speaking situations which has positive implications in effective

communication and stuttering management. Competition plans can also be applied to stuttering management because it will help PWS quickly repair communication breakdowns.

The application of evidence-based sports psychology interventions to stuttering management has the potential to make a positive impact on the quality of life for PWS and improve their communication competence. Further directions include research studies that test the effectiveness of sports psychology interventions used in stuttering therapy.

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